

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A communications method, the method comprising:

operating a first communications device to:

perform a decoding operation on a first signal including encoded signal information;

determine if the encoded signal information included in the first signal was successfully decoded;

when it is determined that said encoded information was successfully decoded, generating an ACK signal having an ACK signal ~~value~~phase; and

when it is determined that said encoded information was not successfully decoded, generating a first NAK signal having a first NAK signal phase, the first NAK signal corresponding to one of a plurality of possible NAK signal values, each NAK signal value, in the plurality of NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and the ACK signal phase differs from said ACK signal value, each of said plurality of possible NAK signal values corresponding to a different level of decoding success.

Claim 2 (Currently Amended): The method of claim 1, wherein said decoding operation produces decoded information, the step of generating a first NAK signal including:

selecting the first NAK signal ~~value~~phase as a function of the quality of the decoded information.

Claim 3 (Cancelled)

Claim 4 (Cancelled)

Claim 5 (Currently Amended): The method of claim 1,

wherein operating the first device to perform a decoding operation includes:

determining the quality of decoded information generated by decoding said encoded information;

wherein operating the first device to generate a first NAK signal includes operating the first device to select the first NAK signal ~~value~~phase as a function of the determined quality of the decoded information; and

wherein operating the first device further includes operating the first device to transmit the generated first NAK signal.

Claim 6 (original): The method of claim 5, wherein determining the quality of the decoded information includes:

maintaining decoding statistics indicating the reliability of the decoded information, said decoding statistics indicating the quality of the decoded information.

Claim 7 (original): The method of claim 6, wherein the maintained decoding statistics include a count of the number of detected errors in the decoded information.

Claim 8 (Currently Amended): The method of claim 5, further comprising:

operating a second device to:

i) receive said first NAK signal; and

ii) determine, from said first NAK signal ~~value~~phase, an amount of redundant information to transmit to said first device from, different amounts of redundant information being determined for at least two different NAK signal values.

Claim 9 (previously presented): The method of claim 5, further comprising:

operating the first device to:

receive in a second signal including redundant information corresponding to said first received encoded signal;
perform an additional decoding operation using said redundant information and information obtained from said first received signal; and
determine if the additional decoding operation successfully decoded the encoded signal information included in the first signal.

Claim 10 (original): The method of claim 9, wherein said step of operating the first device to perform an additional decoding operation includes:

receiving a traffic channel assignment message from a second device; and
identifying from information included in said traffic channel assignment message, the first signal to which said second signal corresponds.

Claim 11 (original): The method of claim 10,

wherein said first device is a mobile node and said second device is a base station; and
wherein the information included in said traffic channel assignment message used to identify the first signal is an index of a traffic segment used to transmit the first signal.

Claim 12 (previously presented): A communications method, the method comprising:

performing a decoding operation on a first signal including encoded signal information, said decoding operation including determining the quality of decoded information generated by decoding said encoded information;
determining if the encoded signal information included in the first signal was successfully decoded;
when it is determined that said encoded information was not successfully decoded, generating a first NAK signal having one of a plurality of possible NAK signal values, each of said plurality of possible NAK signal values corresponding to a different level of decoding success, generating a first NAK signal including selecting the first NAK signal value as a function of the determined quality of the decoded information;
transmitting the generated first NAK signal;
receiving a traffic channel assignment message;

identifying from information included in said traffic channel assignment message, the first signal to which a second signal corresponding to the traffic assignment message corresponds;

receiving in the second signal redundant information corresponding to said first received encoded signal;

performing an additional decoding operation using said redundant information and information obtained from said first received signal;

determining if the additional decoding operation successfully decoded the encoded signal information included in the first signal; and

wherein the information included in said traffic channel assignment message used to identify the first signal is a traffic channel index difference indicating a difference between the index of a traffic channel segment associated with the assignment message and a traffic channel segment used to transmit the first signal.

Claim 13 (original): The method of claim 9, wherein said first device is a base station and said second device is a mobile node, the method further comprising:

operating the first device to transmit an uplink channel assignment message to the second device;

operating the second device to identify from information included in the uplink channel assignment message the first signal for which redundant information is to be transmitted in an uplink channel segment assigned by said channel assignment message; and

operating the second device to transmit said second signal including redundant information.

Claim 14 (original): The method of claim 13,

wherein the information included in said uplink channel assignment message used to identify the first signal is an index of a uplink traffic segment used to transmit the first signal.

Claim 15 (original): The method of claim 13,

wherein the information included in said traffic channel assignment message used to identify the first signal is an uplink traffic channel index difference indicating a difference

between an index of an uplink traffic channel segment associated with the assignment message and an uplink traffic channel segment used to transmit the first signal.

Claim 16 (original): The method of claim 9, wherein said second signal includes, in addition to said redundant information, new encoded information, the method further comprising:

operating said first device to decode said new encoded information.

Claim 17 (original): The method of claim 9, further comprising:

operating the first device to determine if the encoded signal information included in the first signal was successfully decoded by said additional decoding operation; and

when it is determined that said encoded information was not properly decoded by said additional decoding operation, operating the first device to generate a second NAK signal having one of said plurality of possible NAK signal values, each of said plurality of possible NAK signal values corresponding to a different level of decoding success, operating the first device to generate a second NAK signal including selecting a second NAK signal value as a function of the quality of decoded information generated by said additional decoding operation.

Claims 18-25 (Previously Canceled):

Claim 26 (Currently Amended): A communications device comprising:

means for performing a decoding operation on a first signal including encoded signal information;

means for determining if the encoded signal information included in the first signal was successfully decoded; and

means for generating a first NAK signal having a first NAK signal phase, the first NAK signal corresponding to one of a plurality of possible NAK signal values, when it is determined that said encoded information was not successfully decoded, each of said plurality of possible NAK signal values corresponding to a different level of decoding signal success, each NAK signal value, in the plurality of NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a

~~second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and an ACK signal phase differs from an ACK signal value.~~

Claim 27 (Currently Amended): The device of claim 26,

wherein said means for performing a decoding operation produces decoded information;
and

wherein said means for generating a first NAK signal selects the first NAK signal ~~value~~
phase as a function of the quality of the decoded information.

Claim 28 (original): The communications device of claim 27, further comprising:

a transmitter, coupled to said means for generating a first NAK signal, for transmitting
the generated first NAK signal;

a receiver for receiving a second signal including redundant information corresponding to
said first received encoded signal; and

wherein said means for perform a decoding operation includes means for performing an
additional decoding operation using said redundant information and information obtained from
said first received signal.

Claim 29 (Currently Amended): The communications device of claim 28, further comprising:

means for determining if the additional decoding operation successfully decoded the
encoded signal information included in the first signal; and

means for generating a second NAK signal by selecting a second NAK signal ~~value~~
phase
as a function of the quality of decoded information generated by said additional decoding
operation, when it is determined that said encoded information was not properly decoded by said
additional decoding operation, said second NAK signal having one of said plurality of possible
NAK signal values.

Claim 30 (Currently Amended): A method of operating a communications device comprising:

encoding, using an encoder, information to be transmitted to produce a first set of
encoded information and a set of redundant information;

transmitting said first set of encoded information in a first signal;
receiving a NAK signal from a device to which said first signal was transmitted; and
selecting a portion of the set of redundant information to transmit to said first device as a function of ~~the value~~ a phase of the received NAK signal, said received ~~NAK-NAK~~ NAK signal ~~being corresponding to~~ one of a plurality of possible NAK-NAK signal values, each NAK signal value of the plurality of NAK signal values having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and an ACK signal phase differs from an ACK signal value, said function causing different amounts of redundant information to be selected for at least two different possible NAK signal values.

Claim 31 (original): The method of claim 30, further comprising:

including in a first assignment signal used to assign a communications channel segment used to transmit said first signal, an indicator indicating that the first signal does not correspond to a previously transmitted signal; and

transmitting said first assignment signal prior to or in parallel with transmitting said first signal.

Claim 32 (original): The method of claim 30, wherein selecting a portion of the set of redundant information to be transmit includes selecting a larger size portion of redundant information when the value of the NAK signal indicates a first level of received encoded signal quality than when the value of the NAK signal indicates a second level of received encoded signal quality that is better than said first level of received encoded signal quality.

Claim 33 (previously presented): The method of claim 32, further comprising:

transmitting a second assignment signal indicating an assignment of a channel segment to be used to transmit said selected portion of the set of redundant information, said second assignment signal including information identifying a channel segment used to transmit said first signal; and

transmitting the selected portion of the set of redundant information to said first device in a second information signal.

Claim 34 (original): The method of claim 33, further comprising:

performing a second encoding operation on additional information to be transmitted to produce a second set of encoded information and a second set of redundant information; and

wherein transmitting a second information signal includes:

including in said second information signal a portion of said second set of encoded information.

Claim 35 (original): The method of claim 30, wherein said encoding operation is a low density parity check coding operation.

Claim 36 (Currently Amended): A communications device comprising:

an encoder configured to encode information to be transmitted to produce a first set of encoded information and a set of redundant information;

a transmitter configured to transmit said first set of encoded information in a first signal;

a receiver configured to receive signals communicating acknowledgments, said

acknowledgments being either a positive acknowledgement (ACK) signal value or one of a plurality of possible negative acknowledgment (NAK) signal values, from a first device to which said first signal was transmitted, each NAK signal value, in the plurality of possible NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and an ACK signal phase differs from said ACK signal value;

a processing module configured to process received signals to recover there from communicated acknowledgement information; and

a retransmission control module configured to select a portion of the set of redundant information to transmit to said first device as a function of the recovered acknowledgement

information, said function causing different amounts of redundant information to be selected for at least two different possible NAK signal values.

Claim 37 (original): The device of claim 36, further comprising:

means for generating an assignment signal used to assign a communications channel segment used to transmit said first signal said assignment signal including an indicator indicating that the first signal does not correspond to a previously transmitted signal; and

means for controlling the transmitting said first assignment signal prior to transmitting said first signal.

Claim 38 (previously presented): The device of claim 36, wherein said means for selecting selects a portion of the set of redundant information to be transmitted selects a first size portion when the value of the NAK signal indicates a first level of received encoded signal quality, said first size portion being a larger size portion of redundant information than a second size portion which is selected by said means for selecting when the value of the NAK signal indicates a second level of received encoded signal quality that is better than said first level of received encoded signal quality.

Claim 39 (Currently Amended): A communications device comprising:

a decoder module configured to decode a first signal including encoded signal information;

a determination module configured to determine if the encoded signal information included in the first signal was successfully decoded;

a signal generation module configured to generate acknowledgement signals, said acknowledgement signals including an ACK signal having an ACK signal-value phase, when it is determined that said encoded information was successfully decoded, and a first NAK signal having a first NAK signal phase, the first NAK signal corresponding to one of a plurality of possible NAK signal values when it is determined that said encoded information was not successfully decoded, each NAK signal value, in the plurality of NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first

quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and the ACK signal phase differs from said ACK signal value,
each of said plurality of possible NAK signal values corresponding to a different level of decoding success.

Claim 40 (previously presented): The device of claim 39, further comprising:

a quality determination module configured to generate and maintain decoding information indicating the quality of a decoded signal.

Claim 41 (Currently Amended): The device of claim 39, further comprising:

a storage device including NAK level information, said NAK level information including discrete level information, said discrete level information including ~~a~~ the plurality of possible NAK signal values, each of the plurality of possible NAK signal values corresponding to a different level of signal quality and a different phase.

Claim 42 (Currently Amended): A machine readable medium including machine executable instructions, for use in a communications device, said machine readable medium comprising:

instructions for causing said device to perform a decoding operation on a first signal including encoded signal information;

instructions for causing said device to determine if the encoded signal information included in the first signal was successfully decoded;

instructions for causing said device to generate an ACK signal having an ACK signal ~~value~~ phase, when it is determined that said encoded information was successfully decoded; and

instructions for causing said device to generate a first NAK signal having a first NAK signal phase, the first NAK signal corresponding to one of a plurality of possible NAK signal values when it is determined that said encoded information was not successfully decoded, each NAK signal value, in the plurality of NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by

~~an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and the ACK signal phase differs from said ACK signal value~~, each of said plurality of possible NAK signal values corresponding to a different level of decoding success.

Claim 43 (Currently Amended): A communications device comprising:

encoding means for encoding information to be transmitted to produce a first set of encoded information and a set of redundant information;

transmitter means for transmitting said first set of encoded information in a first signal;

receiver means for receiving signals communicating acknowledgments, said acknowledgments being either a positive acknowledgement (ACK) signal value or one of a plurality of possible negative acknowledgment (NAK) signal values, from a first device to which said first signal was transmitted, each NAK signal value, in the plurality of possible NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and an ACK signal phase differs from said ACK signal value;

processing means for processing received signals to recover there from communicated acknowledgement information; and

retransmission control means for selecting a portion of the set of redundant information to transmit to said first device as a function of the recovered acknowledgement information, said function causing different amounts of redundant information to be selected for at least two different possible NAK signal values.

Claim 44 (Currently Amended): A machine readable medium including machine executable instructions, for use in a communications device, said machine readable medium comprising:

instructions for causing said device to encode information to be transmitted to produce a first set of encoded information and a set of redundant information;

instructions for causing said device to transmit said first set of encoded information in a first signal;

instructions for causing said device to receive signals communicating acknowledgments, said acknowledgments being either a positive acknowledgement (ACK) signal value or one of a plurality of possible negative acknowledgment (NAK) signal values, from a first device to which said first signal was transmitted, each NAK signal value, in the plurality of possible NAK signal values, having a NAK signal phase differing from any other one of the plurality of possible NAK signal values, the NAK signal phase between any two of the plurality of possible NAK values having a first quantitative difference less than a second quantitative difference between the NAK signal phase of in said plurality by an amount which is less than the smallest amount any one of said plurality of possible NAK signal values and an ACK signal phase differs from said ACK signal value; and

instructions for causing said device to process the received signals to recover there from communicated acknowledgement information; and

instructions for causing said device to select a portion of the set of redundant information to transmit to said first device as a function of the recovered acknowledgement information, said function causing different amounts of redundant information to be selected for at least two different possible NAK signal values.